

Opportunities for confinement of rice

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The biology of cultivated rice provides many safeguards which prevent gene flow and the establishment of feral rice populations (OECD 1999). The inherent biological safeguards of cultivated rice include the strong selection for self-pollination in the centuries in which man has domesticated rice and continued to improve the crop in modern times. When the USDA established its four public rice breeding stations, one of the first tasks was to set the standards for seed purity in their breeding and seed production programs (Beachell *et al* 1938). Isolation distances of 4.5 to 9 m between drill-seeded varieties were determined to assure genetic purity in breeding and seed production. The purity standard for Foundation Class rice seed was set at 0.01% (1:10,000). Normal practices in rice cultivation, like the separation of varieties by a roadway or irrigation ditch provide sufficient isolation distance to prevent cross-pollination between different rice varieties.

No other outcrossing studies of this scale were undertaken until the advent of herbicide tolerant rice, which enables rapid screening of large numbers of seed. Two key studies completed in the USA at the rice research stations in Louisiana and California (Fischer *et al* 2004) have yet to be published in peer-reviewed journals. However their findings are in line with work published from other regions of the world (Gealy *et al* 2003, Messenberger *et al* 2001) and remain in agreement with Beachell *et al* (1938). In Louisiana, hybrids were only detected between adjacent plants, none were detected at distances out to 21.5 m from the pollen source. In California, none were identified beyond 1.8 meters, the maximum sampling distance was 16.9m.

Today USA rice production is structured to meet the needs of specific markets based upon grain type and quality, and as a consequence, is able to supply a variety of markets for special-use rice (USA Rice Federation annual report of rice distribution patterns). Market segmentation is accomplished by regional production, grain handling and milling facilities. For the case of special rice varieties which are sources of high value proteins, the protocols call for closed production and handling systems far removed from commodity rice production. The confinement of high value protein rice varieties to dedicated farms and equipment, plus the grinding of seed before the raw product is moved to purification facilities are much more than adequate to keep these enterprises separate from the production of commodity rice. A program to monitor for volunteers and the use of distinctive rice varieties (grain and plant habit very different for US commodity rice) provide added assurance.

Taken together, these opportunities for confinement, some from nature and some from man, make rice an ideal crop for the production of high value proteins in the USA.

Citations

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_____'(Beachell *et al* 1938)____
